

**REMARKS**

Claims 1-7 and 9-20 are pending in the application. The claims have been subjected to a restriction requirement and, as well as Applicants' undersigned attorney can understand, a provisional election of species requirement.

**Response to Restriction Requirement**

The claims of the application have been subjected to a four-way restriction requirement, as follows:

- I.     Claims 1-5 and 12, in part, drawn to compounds where R<sub>6</sub> is epoxypropyl;
- II.    Claims 1-5 and 13-17, in part, drawn to compounds where R<sub>6</sub> is 3-chloro-2-hydroxypropyl;
- III.   Claims 6, 7, 9 and 11, drawn to a carbohydrate, method of preparing carbohydrate; and
- IV.   Claim 10, drawn to a method of waste water treatment.

As required, but with traverse, Applicants elect Group II, the hydroxypropyl substituted multiple quaternary ammonium embodiment.

Applicants respectfully traverse the restriction between Groups I and II, and request the Examiner to reconsider the restriction, and to rejoin these two groups, for at least the following reasons.

Applicants note that the Examiner cited case law to the effect that restriction of the members of a Markush group is proper when they do not share a common utility or do not share a substantial structural feature essential to that utility. Applicants respectfully submit that the epoxypropyl and 3-chloro-2-hydroxypropyl do share a common utility, in that both embodiments may be used as disclosed in the application for derivatizing carbohydrates with a multiple cationic functionality. Applicants further respectfully submit that the epoxypropyl and 3-chloro-2-hydroxypropyl do share a substantial structural feature essential to that utility, in that both include a plurality of quaternary ammonium centers and that both the epoxypropyl and 3-chloro-2-hydroxypropyl are capable of reaction with the -OH groups on carbohydrate molecules to form the derivative recited, *inter alia*, in claim 6.

An additional strong reason for keeping the epoxypropyl and 3-chloro-2-hydroxypropyl groups together is that in use, the 3-chloro-2-hydroxypropyl embodiment is reacted in basic solution with the moiety containing the target -OH group and, as is generally accepted in the art, passes through an epoxy intermediate prior to reacting with the target -OH group. Although presented in the context of preparation of the epoxypropyl embodiment, this reaction, to form the epoxy intermediate, is shown near the top of page 19 of the specification in this application. The epoxypropyl embodiment is more reactive and is stored and shipped under refrigeration. The 3-chloro-2-hydroxypropyl embodiment is less reactive and such special handling is not needed. Thus, as shown by the foregoing, these two embodiments are much closer than might be expected on initial review. Therefore, for this additional reason, Applicants respectfully submit that Groups I and II should be kept together in the same application.

In addition to these very strong reasons for maintaining Groups I and II in the same application, any search for a multiple quaternary ammonium compound would most likely be relevant to both embodiments.

In addition, as discussed in the following section relating to species, the differences between the other R groups ( $R_1-R_5$  and in some embodiments,  $R_6$ ) is not as significant as the Examiner appears to suggest in the Office action.

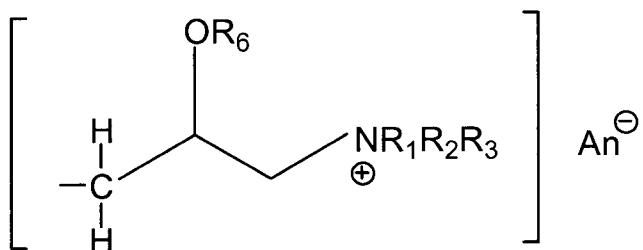
Accordingly, Applicants respectfully (1) traverse the restriction requirement between Groups I and II; (2) request the Examiner to reconsider and withdraw the restriction requirement as applied to Groups I and II; and (3) request examination of both Groups I and II in the present application.

**Election of a Single Compound or Set of Compounds**

To the extent Applicants understand paragraph 4 of the Office action, the Examiner has requested Applicants to elect species, but does not appear to have fully identified what are the species from which the Applicants are required to elect.

As mentioned above, the differences between the other R groups is not as significant as the Examiner implies in the Office action, since none of the R groups is recited as being the OH, COOH, alkoxy, halogen, amino, etc., mentioned in the Office action at page 2.

In fact, as clearly recited in the claims, the  $R_1 - R_5$  and  $R_{1'} - R_{3'}$  groups are all only alkyl, aryl or aralkyl, or a group ( $-CH_2-CH(OR_6)-CH_2N^+R_1R_2R_3 An^-$ ) which simply lengthens the chain of the multiple quaternary ammonium compound, in which the additional  $R_1 - R_3$  and  $R_6$  groups are selected from the same Markush groups as in the claim. In this regard, the Examiner is requested to note that the group in parentheses above has the structure:



which makes clear that this embodiment is simply an extension of the multiple quaternary ammonium compounds set forth in claims 1 and 3. All of the R groups in this alternative are subject to the same description set forth in the claim for the various R groups. Thus, this is a relatively small group and should not require election.

Furthermore, the  $R_6$  groups are only selected from the Markush group of H, alkyl and aralkyl, or the epoxypropyl or 3-chloro-2-hydroxypropyl groups, with the proviso that at least one of the  $R_6$  groups must be the epoxypropyl or 3-chloro-2-hydroxypropyl groups. Thus, this too is a relatively small group and should not require election.

Thus, in actuality there is little variation between the substituents for the various R groups. While these groups are obviously different, it is not as if they are functional groups differing in properties to the extent that OH, COOH, alkoxy, halogen and amino, differ from one another.

For these reasons, Applicants respectfully request the Examiner to reconsider the apparently stated need for an election of species.

However, in case the Examiner should refuse to withdraw the election of species requirement, Applicants elect the species in which all of the R groups, other than the at least one  $R_6$  that is epoxypropyl or 3-chloro-2-hydroxypropyl, are alkyl groups.

**An Additional Invention Group**

Applicants note that the restriction requirement erroneously includes the compounds of claims 13-17 together with Group II. Although Applicants would prefer to have these compounds examined together with the other compounds, it is Applicants' duty to inform the Examiner, and she is requested to note, that none of the compounds in claims 13-17 include an R<sub>6</sub> group. Accordingly, Applicants consider that these compounds should have been in a separate group in the Office action. By electing Group II (or, hopefully, Groups I and II) Applicants effectively do not elect the compounds of claims 13-17.

**Supplemental Information Disclosure Statement**

Applicants submit simultaneously herewith a supplemental IDS to cite one additional reference. Appropriate consideration is respectfully requested.

Should the Examiner consider that a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Applicants do not consider that any additional claim fees are due for the submission of this preliminary amendment. In the event any fees are due in connection with the filing of this paper, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988, docket No. SACHPO148US.

Respectfully submitted,  
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